



# THE NEW YORK ARCHITECT

A NATIONAL MAGAZINE DEVOTED TO THE  
INTERESTS OF ARCHITECTURE AND  
THE ALLIED FINE ARTS.

THE POLICY OF THE MAGAZINE IS DIRECTED BY  
AN ADVISORY BOARD CONSISTING OF TWO ARCHI-  
TECTS, TWO SCULPTORS AND TWO PAINTERS.

DONN BARBER, Editor  
J. HOLLIS WELLS, Architectural Engineering Editor

SUBSCRIPTION—Ten Dollars a year in advance; Single Copies, One Dollar.

PUBLISHED MONTHLY BY

THE HARWELL-EVANS COMPANY

118 EAST 28<sup>TH</sup> STREET

NEW YORK CITY



# THE NEW YORK ARCHITECT

VOL. IV

MARCH, 1910

No. 3

## The New York Architect

Entered at the New York Post Office as Second Class Matter  
PUBLISHED MONTHLY BY

THE HARWELL-EVANS CO.

118 EAST 28th STREET NEW YORK

AUBREY HARWELL, Prest. JOHN R. EVANS, Vice-Prest. and Treas.  
M. L. HOTCHKISS, Secty.  
JACK MAJOR, Advertising Manager

### SUBSCRIPTION RATES

One Year - - - - -	\$10.00
Six Months - - - - -	5.00
Three Months - - - - -	3.00
Single Copies - - - - -	1.00

DONN BARBER, Editor

### CONTENTS

SOME CURRENT CHURCH ARCHITECTURE BY  
CRAM, GOODHUE & FERGUSON

H. Rea Woodman

ARCHITECTURAL ENGINEERING:

CAISSON FOUNDATIONS IN NEW  
YORK CITY, Part I Chas. S. Landers

ST. JOHN'S CHURCH, HARTFORD (1 plate)

THE SAGE MEMORIAL - (3 plates)

ST. MARK'S CHURCH, MT. KISCO (2 plates)

Illustrations in Photogravure.

## SOME CURRENT CHURCH ARCHITECTURE BY

CRAM, GOODHUE & FERGUSON

While the groves may have been "God's first temples," for thousands of years the most costly and beautiful structures have been set aside for religious purposes; pyramid, tabernacle, temple, mosque and cathedral, these are "the marvels in frozen stone" that arrest our attention in history and tradition, these are the pride of the nations, and their lasting monuments.

It is twenty years now since the firm of Cram, Goodhue & Ferguson began designing and building beautiful houses in which people may worship God. In these twenty years the character of ecclesiastical architecture in America has changed insensibly, to quote Mr. Goodhue, "from the more or less crude and barbaric efforts on the part of architect and cleric to draw inspiration from 'Parker's Handbook' and 'The

Anglican Calendar' until now, we in America may almost claim a national Gothic expression of our own. That is, an expression in which our national needs are adapted to the spirit and ideals of the Gothic style."

This firm, though the greater part of their work is based, as a matter of course, upon English Gothic, have never made any pretension to archaeological exactitude. They have welcomed new materials and new devices of all kinds, and adapted them to the purpose in hand. Like Robin Hood, they have proceeded on the theory that he may take who has the power, and he may use who can—an excellent theory which, modernized in its spirit and temper, lies at the foundation of the splendid success they have attained. They realize that conditions within the church have changed, and that the proportions of chancel and nave, that were so long acceptable, will not always bear literal reproduction to-day; they realize, too, that there is no longer one single system of theology and church government with which to deal. They accept conditions as they are, meeting them face to face, and deal with them in that modern, practical service-way that makes for the betterment of the conditions it accepts. To the steadfast, consistent and earnest work of this firm must be given much of the credit for the advance which has been made in church architecture, and for the impetus it has given honest workmanship and higher ideals not only within the church, but without it as well.

In a recent interesting interview with Mr. Goodhue, an interview on which this article is founded, though it "follows him afar," so to speak, that gentleman talked frankly about his work, and the work the firm have in hand. When they commenced, twenty years ago, he acknowledged, the clergymen demanded pure Gothic, and thought they were getting it. The level of craftsmanship was at almost its lowest ebb; the sacred utensils of the chancel, and indeed, all items of church furniture, were bought "in stock" as one buys tables and chairs at a furniture store, though the stone mason was freer and possibly more capable than at present, for to-day Labor Unions and Machinery have tied the hands of the stone-cutter, and the Unions have limited the number of apprentices in order that the ranks of the guild may not become overcrowded. Conditions have improved in a sense, but against this very "Improvement"

## THE NEW YORK ARCHITECT

the architect can make but slow progress in his work, a tedious progress against the influences of an ultra-material age.

That the work of Cram, Goodhue & Ferguson is broadly acceptable, is proved by the fact that they are at present building churches for five different denominations. It is a mere coincidence that of the four buildings herewith illustrated three are for the Episcopal church. In a recent competition for a Baptist church at Pittsburg, in which there were sixty-five entries, their designs were successful and they are now engaged on a group of buildings, church, parish house and manse, at the corner of Eighty-fifth street and Park avenue, for the "South" Parish (Dutch Reformed), a descendent of the original church at the Fort, the first church edifice built on Manhattan Island.

"Turn now to the pictures," as the children say. In this case, the "pictures" illustrate four of the churches, that the firm have now in course of construction, or have recently completed. For variety of material and type, in the problems offered in each, and the net result of beauty and utility obtained, these four edifices form a delightful study. To name them briefly before going into a description of them: St. John's at Hartford, has been completed and occupied three months; The Sage Memorial, at Far Rockaway, is practically completed now, and is to be dedicated in the near future; the foundations of St. Mark's, at Mount Kisco, are just rising above ground, while the illustrations for the fourth, the proposed Episcopal Cathedral at Los Angeles, are taken from the 'preliminary studies,' and are, of course, frankly tentative.

### ST. JOHN'S CHURCH.

The first of these churches, St. John's, at Hartford, is a small building, with a seating capacity of four hundred and fifty, the cost of which had to be kept down to the lowest sum consistent with obtaining the required accommodations, and a measure of good workmanship throughout. Now, of course, it is one of the most Gothic of principles that a structure should seem native to the soil from which it springs, hence local material should be used whenever possible; and this was the invariable rule in Europe until increasing wealth and consequent decadence brought about a desire for, and improved methods of transportation, made possible the use of, materials foreign to the locality, and to the very spirit of the style. In harmony with earlier traditions, for the ashlar surfaces of St. John's a local seam-faced trap-rock was used, a rustic material which varies considerably in color running from a pale gray, through a gamut of yellows and browns, to a deep purple. For trimmings, both inside and out, concrete was employed, set in blocks, but without any pretense to masquerade it as nat-

ural stone. The various offices in every case, are no larger than was absolutely necessary, and include, in addition to those shown in the ground floor plans, a parish parlor in the second story, for the use of the different guilds and societies, and, in the basement, an adequate Sunday School hall, as well as two class rooms.

The whole structure is as nearly fireproof as may be, but with a timbered ceiling, the designers holding that this will not be subject to the attack of fire, if all the rest of the building be of masonry. The floor of the nave and aisles is of granolithic; that of the choir and sanctuary of green slate and Mercer tile—a favorite combination of the designers, by the way, and a most beautiful one.

### THE SAGE MEMORIAL.

The Russell Sage Memorial (First Presbyterian Church), at Far Rockaway, is the second of this group of churches. It is to be dedicated in the near future, being now, as the illustrations show, practically complete, with the exception of the grading and planting of the grounds. We have used Mr. Goodhue's original pen drawing because it represents the group standing amid surroundings such as they will be when finally complete, and so gives a truer idea of the entire effect than would a photograph of the completed building on the uncompleted grounds.

The conditions which governed the designing and building of this Memorial were unusual, and must have been peculiarly gratifying to the architects. A certain definite sum was to be expended, no more and no less, and it was desired that this amount should be used in full. To the limits of this stipulated sum, the designers were rigidly held, otherwise they were entirely free, free from the trammeling and sometimes heart-breaking influences and strictures often put upon the architect. Thanks to these very definite conditions, and to this no less definite freedom, many features unusual in such work were made possible, such as the extremely rich crossing ceiling "dight with colour and gold."

We have Mr. Goodhue's authority for the statement that the Sage Memorial, containing in reality three buildings, the church, the parish house and the manse, has been completed exactly for the sum laid down, no more and no less. When we say "exactly for the sum laid down," we mean not as to the general contract alone, but that everything, even to the lighting fixtures, organ and rugs, is included, as well as the architects' commissions. Everything, in fact, but the furnishing of the manse, which was properly left to the taste and discretion of the one who should be its occupant.

The chancel arrangement of this church is worthy of attention, for it is an effort in the right direction to solve one of the most perplex-

## THE NEW YORK ARCHITECT

ing and long-standing problems of Protestant church architecture. Here in America the usual—and traditional—solution of the difficulty is, of course, to give to the organ the place of prominence and honor, and the consequent relegation of the pulpit and the communion-table to positions of not only relative but actual insignificance. In the Sage Memorial, however, there are two galleries set on either hand, one of

which is entirely filled by the organ, the other devoted to the uses of the choir and the organist. This arrangement leaves the end wall free to be occupied by a series of seven elaborately canopied stalls, the middle one being slightly accented. This pseudo reredos (or since the original Latin root means simply "a backing," the pseudo can be omitted) is effective, and adds distinction to the beauty and logic of the whole.



TRIPLE LIGHT WINDOW IN CHANCEL  
FROM THE ARCHITECTS' CARTOON  
THE RUSSELL SAGE MEMORIAL, FAR ROCKAWAY, L. I.

## THE NEW YORK ARCHITECT

### ST. MARK'S CHURCH.

St. Mark's, at Mount Kisco, is one of the smallest of churches, having a seating capacity of only a trifle over two hundred, yet into its designing has gone as much thought and energy, as fifty years ago, would have sufficed for the production of a cathedral. As things architectural go nowadays, it is rather an expensive building, but its careful elaboration and perfection should, in the end, well recompense those who have made it possible. Upon it Messrs. Cram, Goodhue & Ferguson have expended much thought and labor, and they hope that it will display, when finished, the highest grade of workmanship they have found it possible to obtain at present.

St. Mark's nestles under a low and heavily wooded ridge, and its chancel end, which reaches well beyond the beginning of the upward slope of the ridge, is driven into the ground, just as in many little English churches of similar type, attaining by this simplest and most practical of devices a certain unusual quaintness of charm. The whole setting of the building in its surroundings is characteristic, for its designers' methods are a subtle combination of the practical and the artistic—a fact that accounts, in a measure, for such successful work. Architecture is, with the possible exception of music, the highest, and certainly without exception the most practical, of the arts, and no better praise can be accorded an architect than to say that he is at once a practical designer and a lover of beauty. But this is by the way. To return to St. Mark's. The floor of the nave and the aisles is to be of flag-stones, human-worn stones, over which millions of passing feet have hurried in the restless and importunate life of the modern city. Everywhere a carefully studied attempt has been made to obtain a modicum at least of the charm inherent in genuine mediæval work. So the sturdy pillars that support the clerestory are not dully identical in form, but vary subtly with here an octagonal shaft, there one that is neither octagonal nor yet absolutely round. The avoidance of anything that savors of repetition is here carried to its furthest, not only this, but each individual bit of carving is meant to tell its own story or drive home its moral to the beholder's mind. The hardware also, designed by the architects as a matter of course, is of hand wrought steel throughout, and in it simple thumb latches or heavy rim locks take the place of the usual mortise lock of commerce. With all the care and thought that has gone to the making of this building, nothing of bombast can be found in it, nothing that could be classed as needless, no buttress is here that has no thrust to take, no meaningless pinnacle or castellation. All is as it should be, to quote the prayer book, "Godly, righteous and sober."

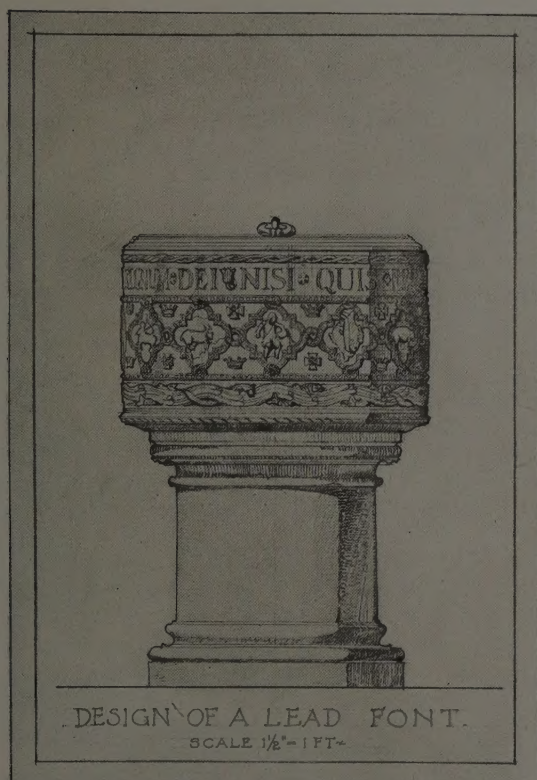
### PROPOSED CATHEDRAL AND HOSPITAL.

The fourth and last of the group, is a cathedral to be erected in Los Angeles, California. It is difficult to enter upon any extended description of this building, and perhaps hardly wise to do so, since the whole is, as yet, in no very definite state and no drawings have been prepared other than the tentative preliminary sketches herein reproduced.

The erection of such a group of buildings a sort of ecclesiastical acropolis, presents a fascinating problem to the architect as well as a very difficult and complex one. Briefly stated, it is this: A modern cathedral is to be constructed, a genuine cathedral, one that is, that shall be not only self-contained and with all the proper offices of the chapter, but that shall serve too, the purposes of a parish church, and in connection with all this, a hospital of considerable dimensions. These buildings are to stand on a number of city lots, and it is necessary to maintain throughout the group, the high, serene spirit that must always animate structures of this type, while the hospital must embody every element that present-day skill, science and invention have proved to be essential.

Further to complicate this problem, the local conditions of climate, history, tradition and landscape are so unique, so different from ours here in the East as to make the erection of a cathedral along the typically English lines, ordinarily favored by this firm, not to be considered for a moment. The incongruity of an English tower or spire rising from a group of most-tropical-looking palms, or of a great forest of crocheted pinnacles outlined against a range of the bluest and most-Italian-looking of mountains manifests itself at once. Furthermore, though Los Angeles happily escaped the earthquake which wrought such terrible havoc in San Francisco, the City of the Angels does not count herself immune, and the fear of earthquakes is an ever-present one. To meet this possibility, a system of construction must be devised that will practically guarantee the integrity of the buildings against such disasters of nature. Since a timbered ceiling does not comport itself with the dignity inherent in a cathedral, a vault form has been adopted, to be constructed of Guastavino tile, the ribs being of the same material and not of stone. The fact that these tile form a true vault, yet, when "set" become absolutely homogeneous, makes this material seem in this case almost divinely-appointed.

The very early history of California, and a large part of her traditions are Spanish; the climate of the southern part of the State suggests the Mediterranean, and the landscape of the country that surrounds Los Angeles is more



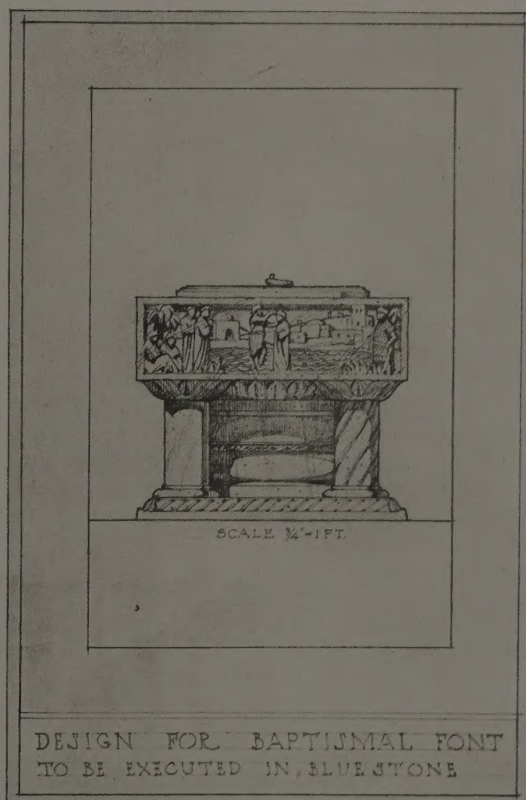
like the Riviera than the Riviera itself. With these facts and conditions in mind, the designers have produced, on paper, at least, an architectural mass that recalls, though somewhat remotely, it is true, such examples as Segovia or Salamanca, rather than Durham or Canterbury. Experiments in exterior color are of doubtful value in our northern climate and environment, and necessarily attended with much risk, but they seem quite the natural thing in the subtropical climate and surroundings of southern California. Accordingly, it is the intention of the designers of the cathedral to give free rein to such "color impulses" in this instance.

While Mr. Goodhue is hopeful of the conditions that limit, at present, the working out of the ideals of an architect, his is not the irresponsible optimism of the man who doesn't know. It is rather the steady faith of the man who understands. Architecture, he says, seems nowadays to be less than ever so simple a matter as the drawing of pretty plans and pictures, and then watching the materialization of the building from the pretty pictures. It is a slow evolution—a fusion of beauty and utility and materials and ideals—the reconstruction of traditions, and their application to the needs of the present. Architects are divided into several distinct classes; at one extreme stands the purely business-like individual whose whole end and aim—and it is Mr. Goodhue admits, a jus-

tifiable end, is the production of the 'loft' or office building in the shortest possible space of time. Every day this building is needlessly kept under construction, and hence not available for renting purposes, is a sheer financial loss to client, builder, and indirectly, to the architect. There is not time for the evolution of ideas; everything must be done instantaneously. Such an architect maintains that it is idle to devote any more time to the preparation of his buildings than shall make them fulfill all practical requirements.

He penalizes the contractor heavily, and, it is rumored, sometimes wagers, with him, vast sums, that the building under construction will not be completed by a certain date, glad enough if he can only lose his stake. Another rumor is to the effect that his full-sized detail for a window box and frame, for instance, is often "kept standing" as the printers say, and used again and again. His materials are those readiest to hand, especially as to stone, and have been used so constantly that we are actually suffering from the uniformity of such buildings—a uniformity that greatly grieves the true artist.

At the other extreme, opposite this business-like individual, stands the artist pure and simple, long-haired perhaps, and wholly lacking in the practical sense, whose stairways are usually without the very necessary element of head-



## THE NEW YORK ARCHITECT

room, and whose loftiest scorn is directed toward those who maintain the necessity of fitting a design to the purse of the client. Midway between these two, and inclining, it may be only sympathetically, toward the second stands the architect whose care is for the little refinements and niceties that to the first seem merely trivial, and yet who sincerely respects reason and logic. The path of this sort of architect is difficult, Mr. Godhue thinks, because in his completed work he longs, usually in vain, for some of the qualities of hand and soul—the individual work of the individual craftsman to interpret his ideas, in an age when the hand seems no longer to be trained in any given direction, except, indeed, that of mechanical finish, while the soul is, apparently, entirely absent from the workman's effort. And even when this ability is found, the cost of individual workmanship is so high as to be practically prohibitive. For in this over-commercialized age, a false valuation is put upon such handwork, and the ability to produce art is held so high an accomplishment that its possessor assumes the airs of an aristocrat and lords it over his fellow-workers—and charges accordingly!

It is against this condition of things that the firm of Cram, Goodhue & Ferguson is making valiant war, and it is significant that every year sees a notable increase in the amount of work intrusted to their care, for faith and hope and ability, with which qualities this firm seems generously endowed in the long run are certain to make their influence felt.

H. REA WOODMAN.

## ARCHITECTURAL ENGINEERING

J. HOLLIS WELLS, EDITOR.

### CAISSON FOUNDATIONS IN NEW YORK CITY.

The development of high-building construction in New York City, especially in the downtown district, during the past few years has formed a close alliance between the architect and the engineer, for the modern office building is such a composite structure that it is practically impossible for one man or one company to have at command sufficient knowledge of the various branches of engineering required. Any high building in lower Manhattan to-day requires the services of representatives of the four great branches of engineering, viz.—mechanical, for the light, heat and power plants; electrical, for the electric lights and elevators; civil, for the structural steel and pipes for water, gas and fire protection, and mining, for the foundations, which are almost invariably caissons sunk by the pneumatic process. The architect must have a sufficient knowledge of all these engineering problems to know just how far his

own judgment and experience are sufficient, and when it becomes necessary to call upon those who have given special attention to a subject which demands particular attention.

The congested condition of the island of Manhattan from the Battery to the City Hall, caused by the constant demand for office buildings, together with the inevitable cry for better transit facilities, has developed a style of architecture that is peculiar to New York and which is not to be found in any other city of the world. Probably the most noted of these structures are the Trinity, U. S. Realty, Singer, City Investing and Hudson Terminal buildings. These buildings, ever increasing in height, have converted Broadway, Exchange Place, Wall, Nassau, William and New streets into veritable canyons and the multitude of workers into modern cliff-dwellers. The value of real estate has increased to such an extent that it is no uncommon sight to see one skyscraper demolished only to be replaced by one still higher. A recent example is the Gillender Building, on the northwest corner of Nassau and Wall streets, a twenty-story building which, together with the buildings adjoining, will be razed to make way for the Bankers' Trust Company Building, which will be thirty stories high.

In addition to the architecture which has been evolved, there has been a corresponding development of the mechanical and engineering requirements, all of which were vital, and without which the modern skyscraper would have been a practical impossibility. One of the most interesting developments has been that of the construction of the foundations which is necessary to the stability and integrity of the entire structure. To understand the difficulty which confronted the engineer, it is necessary to have some knowledge of the geologic formation of Manhattan Island and know that the glacier which once swept down over the country terminated in a line roughly defined by Long Island and Manhattan, and extending westward through New Jersey and the southern part of Pennsylvania. Unmistakable evidence of this fact has been found in excavations by the deposits of sand and boulders of serpentine worn perfectly smooth, showing the glacial scratches. Fragments of petrified wood were found in the excavation of the foundations of the Singer Building at a depth of more than 90 feet, which were probably carried there by glacial action. The bed-rock which underlies the lower part of Manhattan Island is found at various depths, ranging from 50 to 100 feet below the present street surface, while borings sometimes reveal the existence of greater depths, indicating the probable effects of former stream erosion. The bed-rock gradually rises towards the surface as one goes north until at Madison

## THE NEW YORK ARCHITECT

Square it approaches the surface, as indicated by the foundations of the Metropolitan Tower, which were entirely in rock. Continuing to the north the rock outcrops at the northern part of Central Park and in Bronx Park, where it can still be seen.

In connection with the depth of the underlying bed-rock, it is interesting to note the investigations made by the Pennsylvania Railroad in driving the tunnels through the silt of the Hudson River, opposite Thirty-second Street, where an investigation was made of the possibility of using screw piles for the foundation of the tubes, which are of cast iron, 23 feet in diameter and lined with concrete. Special segments of the cast-iron lining were made, which were afterwards removed so that borings could be made from the tunnel to the river-bed. These borings showed the bed-rock of the river bed at a depth of 300 feet below the surface, which prohibited the practical use of screw piles, and the tunnels remain unsupported except for the silt through which they were driven. It is possible now to predict with some degree of accuracy the depth of bed-rock in Manhattan through the investigation by borings and construction during the past ten years for tunnel, subway, water supply and building construction, and the information is being added to daily.

In lower Manhattan the condition is unique, in that the demand for high buildings is in the very part of the island where it is most difficult to secure foundations that will safely carry the tremendous loads of a skyscraper and be safe against the dangers of settlement caused by the construction of a subway or tunnel along side or beneath it, or the erection of another building adjacent. It is the necessity of insuring against the danger of future construction that the modern method of sinking pneumatic caisson foundations has become almost imperative. It is frequently said that sand makes a thoroughly safe foundation, when the load does not exceed six or eight tons per square foot, but this is only true when it is confined in some way, a condition which seldom exists, or where the foundation is carried to a sufficient depth to insure against any possible future disturbance. There is probably not a building on lower Broadway on a sand foundation which does not show some indication of settlement, either being out of plumb or by cracks, due to the subway and building construction, notwithstanding the fact that the contractor must protect the adjoining property by shoring and underpinning and is liable for any damage caused by his work.

The method of sinking caissons by the pneumatic process is of comparatively recent origin,

the first job being the Manhattan Life Building, 66 Broadway, in the year 1893. Since that time more than thirty buildings have been erected in lower Manhattan, the foundations for which have been built by this process, and with the network of subways and tunnels ever increasing and making a honey-combed structure of the material overlying the rock the number is bound to increase. A complete description of the method of sinking foundations is impossible unless accompanied by a description of the contractor's plans and sketches showing the relation between the caisson, shafting, air-lock and air-compressor, the method of building up the concrete, excavating in the caisson and the various devices employed to sink the pier. Even with the aid of sketches and photographs it is difficult for one to understand the details in full unless he has had experience with work of a similar nature involving the use of compressed air, such as the tunnels which have recently been completed underneath the East and North rivers. A brief description will be attempted, however, of the modern methods of construction as represented by the foundation of the Municipal Building for the City of New York, the largest foundation job which has ever been attempted.

This building, which will contain the offices of the various city departments, will be located east of the Hall of Records and City Hall Park and immediately north of the New York terminal of the Brooklyn Bridge on two irregular blocks bisected by Chambers Street. The site is bounded by Center, Reade and Duane streets, Park Row and Tryon Row. On the east side in Park Row is the elevated railway; on the west side, beneath Center Street, is the present subway, and in the basement of the building itself there will be a six-track station of the subway connecting the Manhattan and Brooklyn bridges. The building, from the plans of McKim, Mead & White, will be twenty-five stories high, surmounted by a tower fifteen stories high, which will rise 560 feet above the street level. Chambers Street will pass through the arcade of the building, directly under the tower. The construction of the foundations has already aroused considerable discussion through the popular press and technical journals on account of an unusual situation which arose when it became known that the depth at which rock was found by the contractor's borings at the north end of the lot was below the pneumatic limit. The borings made by the City showed rock about 100 feet below the elevation of mean tide, which was evidently boulder instead of bed-rock, inasmuch as subsequent borings near the same place showed this elevation to be about 177 feet below mean tide. The practical depth to which pneumatic work can be applied is about 115 feet,

## THE NEW YORK ARCHITECT

which is equivalent to a pressure of 50 lbs. per square inch in quicksand, where the full hydrostatic pressure may be exerted. It is true that men have endured and even worked in pressure greater than this, but it is a danger which few care to risk. Various methods were considered for carrying the foundation to rock by solidifying the quicksand, either by the freezing method or by injecting cement grout, lowering the ground-water level by pumping and driving pipes or piles from the bottom of the pneumatic caisson. These schemes were all abandoned

on account of the risk and expense connected with them, and it was finally decided to carry the caissons for the tower and south wing of the building to bed-rock, while those of the north wing are to rest on sand, about forty feet below mean tide level, which is expected to be below the level of any future disturbance. The caissons on rock are designed to withstand a pressure of fifteen tons and on sand six tons per square foot.

CHAS. S. LANDERS.

*(To be concluded.)*

